In the Claims

1. (Currently amended) A method of producing a winding for a high voltage transformer including the steps of:

forming a predetermined number of spaced conductor winding groups joined together to form a single winding of the transformer; and

winding each spaced winding group as a solenoid-type winding having, in section, a plurality of interwoven axial columns and radial rows from a predetermined number of turns of conductor, wherein a spacing (a_n) between an n^{th} solenoid-type winding and an $(n+1)^{th}$ solenoid-type winding is greater than a spacing (a_{n+1}) between the $(n+1)^{th}$ solenoid-type winding and an $(n+2)^{th}$ solenoid-type winding, an individual coil to coil partial capacitance (C_n) between the n^{th} solenoid-type winding and the $(n+1)^{th}$ solenoid-type winding being greater than an individual coil to coil partial capacitance (C_{n+1}) between the $(n+1)^{th}$ solenoid-type winding and the $(n+2)^{th}$ solenoid-type winding, thereby providing a substantially uniform lighting impulse distribution across the transformer.

2. (Original) A method according to claim 1 further including the step of selecting the number of spaced winding groups and number of turns of each winding group such that a predetermined voltage stress for a given operating voltage of the transformer is not exceeded.

3. (Previously presented) A method according to claim 1 wherein the winding is formed from high temperature superconductors.

4. (Previously presented) A method according to claim 1 including the step of forming each winding group from a single uninterrupted length of conductor.

5. (Previously presented) A method according to claim 1 wherein each conductor turn includes a plurality of conductors.

6. (Previously presented) A method according to claim 1 wherein the winding groups are spaced and stacked vertically.

7. (Original) A method according to claim 6 including the step of winding each winding group in sequence vertically.

8-14. (Canceled)

15. (Currently amended) A high voltage transformer comprising:

a winding including a predetermined number of spaced winding groups joined together to form a single winding of the transformer, each spaced winding group being solenoid wound from a predetermined number of turns having, in section , a plurality of interwoven axial columns and radial rows, wherein a spacing (a_n) between an n^{th} winding group and an $(n+1)^{th}$ winding group is greater than a spacing (a_{n+1}) between the $(n+1)^{th}$ winding group and a $(n+2)^{th}$ winding group, an individual coil to coil partial capacitance (C_n) between the n^{th} winding group and the $(n+1)^{th}$ winding group being greater than an individual coil to coil partial capacitance (C_{n+1}) between the $(n+1)^{th}$ winding group and the $(n+2)^{th}$ winding group, thereby providing a substantially uniform lighting impulse distribution across the transformer.

16. (Original) A transformer according to claim 15 wherein the transformer is a superconducting transformer.

17. (New) A method according to claim 1 wherein each solenoid-type winding has a winding length such that a lighting impulse creep strength of dielectrics is met across a coil face of the transformer.

18. (New) A method according to claim 1 wherein a voltage between the n^{th} and $(n+1)^{th}$ solenoid-type windings meets a lighting impulse breakdown strength of a dielectric between the n^{th} and $(n+1)^{th}$ solenoid-type windings.

19. (New) A method according to claim 1 wherein a voltage between the n^{th} and $(n+1)^{th}$ solenoid-type windings meets a power frequency breakdown strength of a dielectric between the n^{th} and $(n+1)^{th}$ solenoid-type windings.

20. (New) A transformer according to claim 15 wherein each winding group has a winding length such that a lighting impulse creep strength of dielectrics is met across a coil face of the transformer.

21. (New) A transformer according to claim 15 wherein a voltage between the n^{th} and $(n+1)^{th}$ winding groups meets a lighting impulse breakdown strength of a dielectric between the n^{th} and $(n+1)^{th}$ winding groups.

22. (New) A transformer according to claim 15 wherein a voltage between the n^{th} and $(n+1)^{th}$ winding groups meets a power frequency breakdown strength of a dielectric between the n^{th} and $(n+1)^{th}$ winding groups.